

BUFFALO MUSEUM OF SCIENCE
HUMBOLDT PARK
BUFFALO, NEW YORK

DIVISION OF
GEOLOGY AND PALEONTOLOGY



July 31, 1930

Dear Cooper,

I found the copy of your
paper; many thanks.

The map is enclosed,

There are undoubtedly other outcrops
of the Salamanca but they are scarce
and these are all that I found
while there. I did not keep a complete
record of outcrops of formations other
than the Salamanca. There are
some additional localities where
Salamanca float is thick.

With best wishes for Mr. Cooper
and yourself.

Sincerely yours

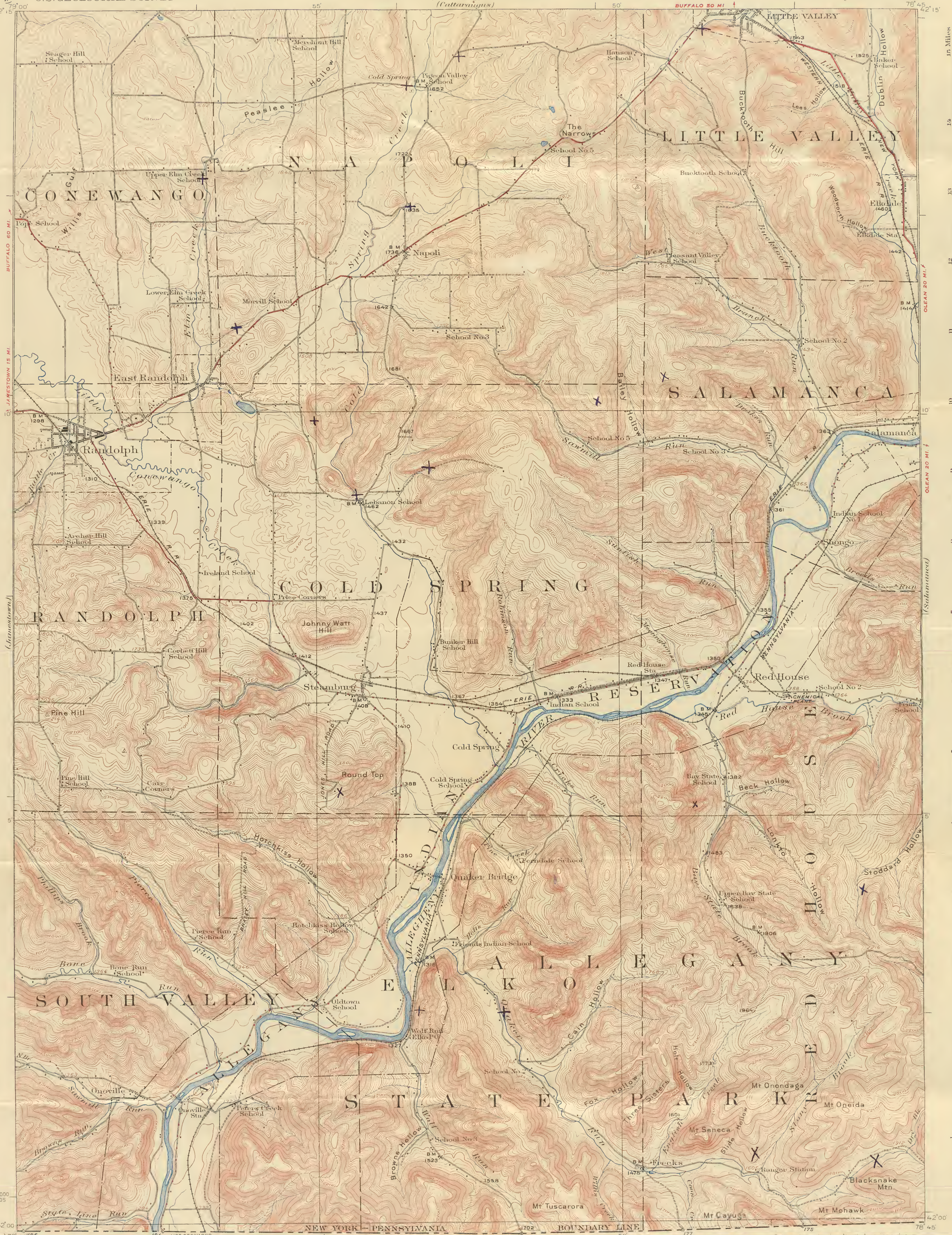
John T. Sanford

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

STATE OF NEW YORK
FRANK M. WILLIAMS
STATE ENGINEER AND SURVEYOR
(Cattaraugus)

NEW YORK
(CATTARAUGUS COUNTY)
RANDOLPH QUADRANGLE

X outcrops of Salamanca congl.
+ other outcrops (incomplete)



Topography by H.H. Hodgeson and J.L. Lewis.
Surveyed in 1922 in cooperation with the State of New York.

Scale 1:62,500
1 inch = 1 mile
0 1 2 3 4 Miles
0 5000 10000 15000 20000 Feet
0 1 2 3 4 Kilometers

Contour interval 20 feet.
Datum is mean sea level.

Polyconic projection North American datum.
5000 yard grid based upon U.S. zone system, 8.

THROUGH ROUTES
SECONDARY ROUTES
SECTIONS IN POOR CONDITION

RANDOLPH, N.Y.
Edition of 1923

THE TOPOGRAPHIC MAPS OF THE UNITED STATES

The United States Geological Survey is making a standard topographic atlas of the United States. This work has been in progress since 1882, and its results consist of published maps of more than 40 per cent of the country, exclusive of outlying possessions.

This topographic atlas is published in the form of maps on sheets measuring about 16½ by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the standard maps are of nearly uniform size, they represent areas of different sizes. On the lower margin of each map are printed graphic scales showing distances in feet, meters, and miles. In addition, the scale of the map is shown by a fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale $\frac{1}{62,500}$ means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 similar units on the earth's surface.

Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys for the United States proper and the resulting maps have for many years been divided into three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—relating, for example, to mineral development, irrigation, or reclamation of swamp areas—are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{62,500}$ (1 inch = one-half mile), with a contour interval of 1, 5, or 10 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{125,000}$ (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{250,000}$ (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since 1898, and nearly 37 per cent of its area has now been mapped. About 10 per cent of the Territory has been covered by reconnaissance maps on a scale of $\frac{1}{62,500}$, or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of $\frac{1}{125,000}$, but about 4,000 square miles has been mapped on a scale of $\frac{1}{250,000}$.

About half of the Hawaiian Islands has been surveyed, and the resulting maps are published on a scale of $\frac{1}{62,500}$.

The features shown on these maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture (works of man), such as towns, cities, roads, railroads, and

boundaries. The conventional signs used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, the lakes, and the sea by blue water filling or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly inclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at

their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined table-land that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

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Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margins of the map are printed the names of adjoining quadrangles of which maps have been published. Over 3,000 quadrangles in the United States have been surveyed, and maps of them similar to the one on the other side of this sheet have been published.

The topographic map is the base on which the geology and mineral resources of a quadrangle are represented, and the maps showing these features are bound together with a descriptive text to form a folio of the Geologic Atlas of the United States. More than 200 folios have been published.

Index maps of each State and of Alaska and Hawaii showing the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained for 10 cents each; some special maps are sold at different prices. A discount of 40 per cent is allowed on an order for maps amounting to \$5 or more at the retail price. The geologic folios are sold for 25 cents or more each, the price depending on the size of the folio. A circular describing the folios will be sent on request.

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THE DIRECTOR,
United States Geological Survey,
Washington, D. C.

January, 1924.

CONVENTIONAL SIGNS

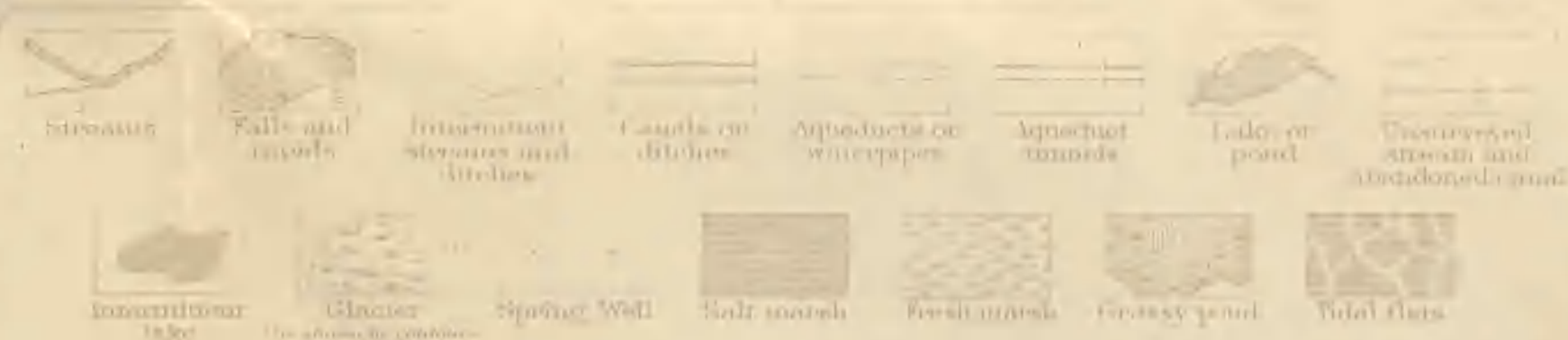
CULTURE (printed in black)



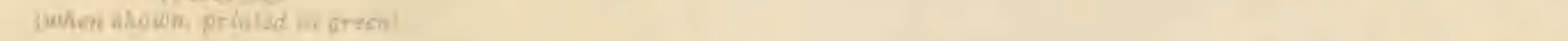
RELIEF (printed in brown)



WATER (printed in blue)

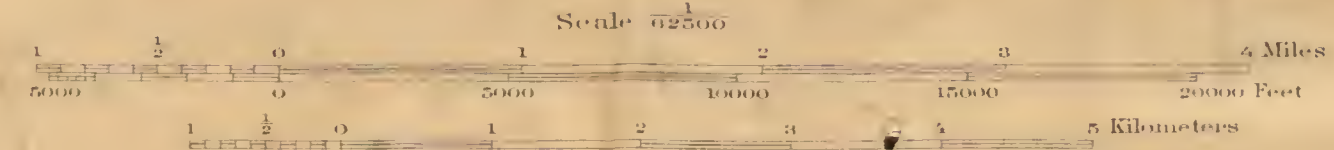


WOODS (when shown, printed in green)





Topography by H.H. Hoagerson and J.L. Lewis,
Surveyed in 1922 in cooperation with the State of New York.



Contour interval 20 feet.
Datum is mean sea level.

Polynomial projection, North American datum.
5000 yard grid based upon U.S. zone system, B.
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RELIEF (printed in brown)



WATER (printed in blue)



WOODS (when shown, printed in green)

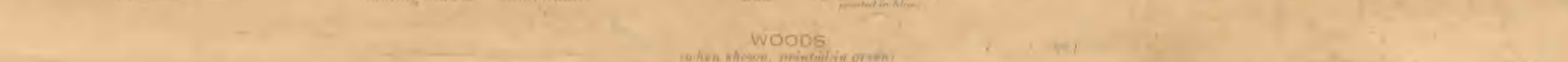
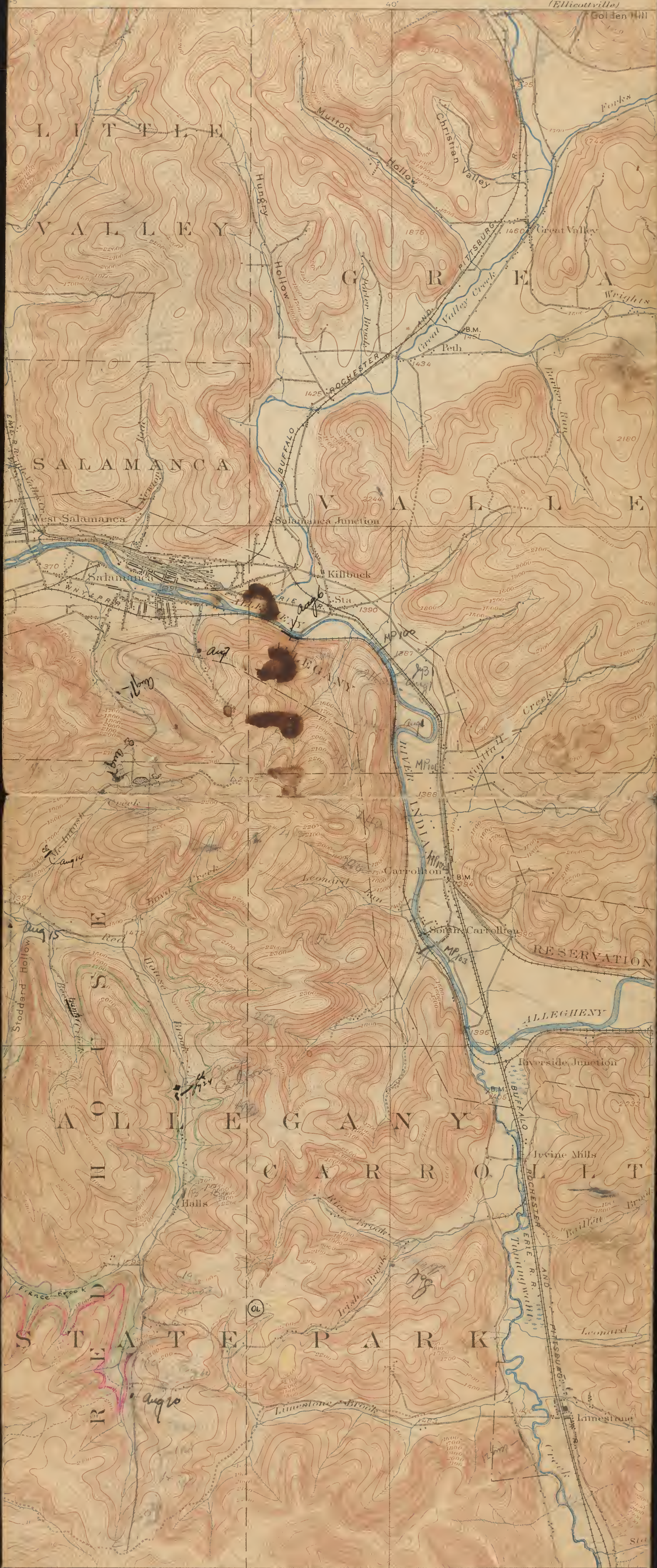




Figure 133 Bird's-eye view of Allegheny State Park





ENGRAVED SEPT. 1899 BY U.S.G.S.

H. M. Wilson, Geographer in charge.
Control by W. J. Peters and J. H. Jennings
Topography by J. H. Jennings and C. C. Bassett.
Surveyed in 1897

Bassett
Jennings

Scale 1:62,500
1 1/2 0 1 2 3
1 1/2 0 1 2 3

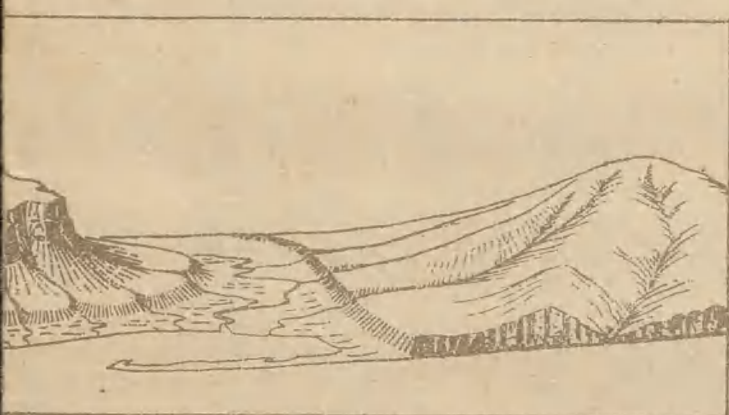
Contour interval 20 feet
Datum is mean sea level

MAPS OF THE UNITED STATES

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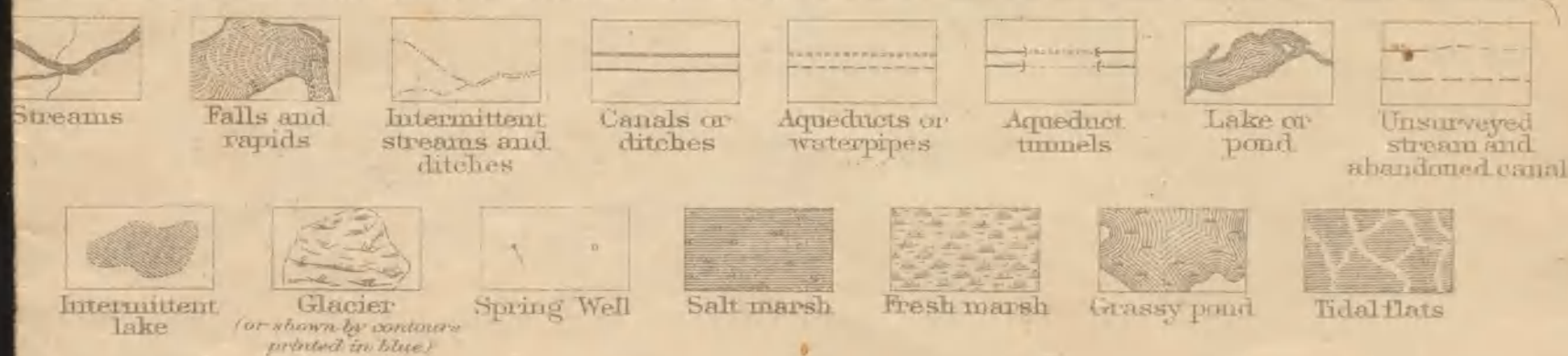
January, 1924.

CONVENTIONAL SIGNS

CULTURE (printed in black)



WATER (printed in blue)



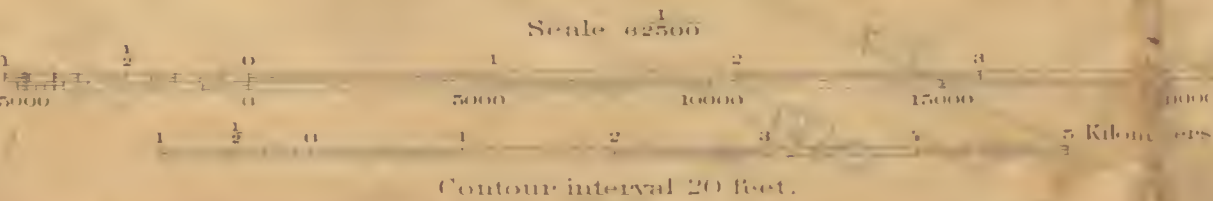
WOODS

(when shown, printed in green)



Locate Buffalo
Camp Exp.

Topography by H.M. Hedgeson and
surveyed in 1922 in cooperation with the State of N.Y.



Contour interval 20 feet.
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(printed in black)

RELIEF
relief, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 91

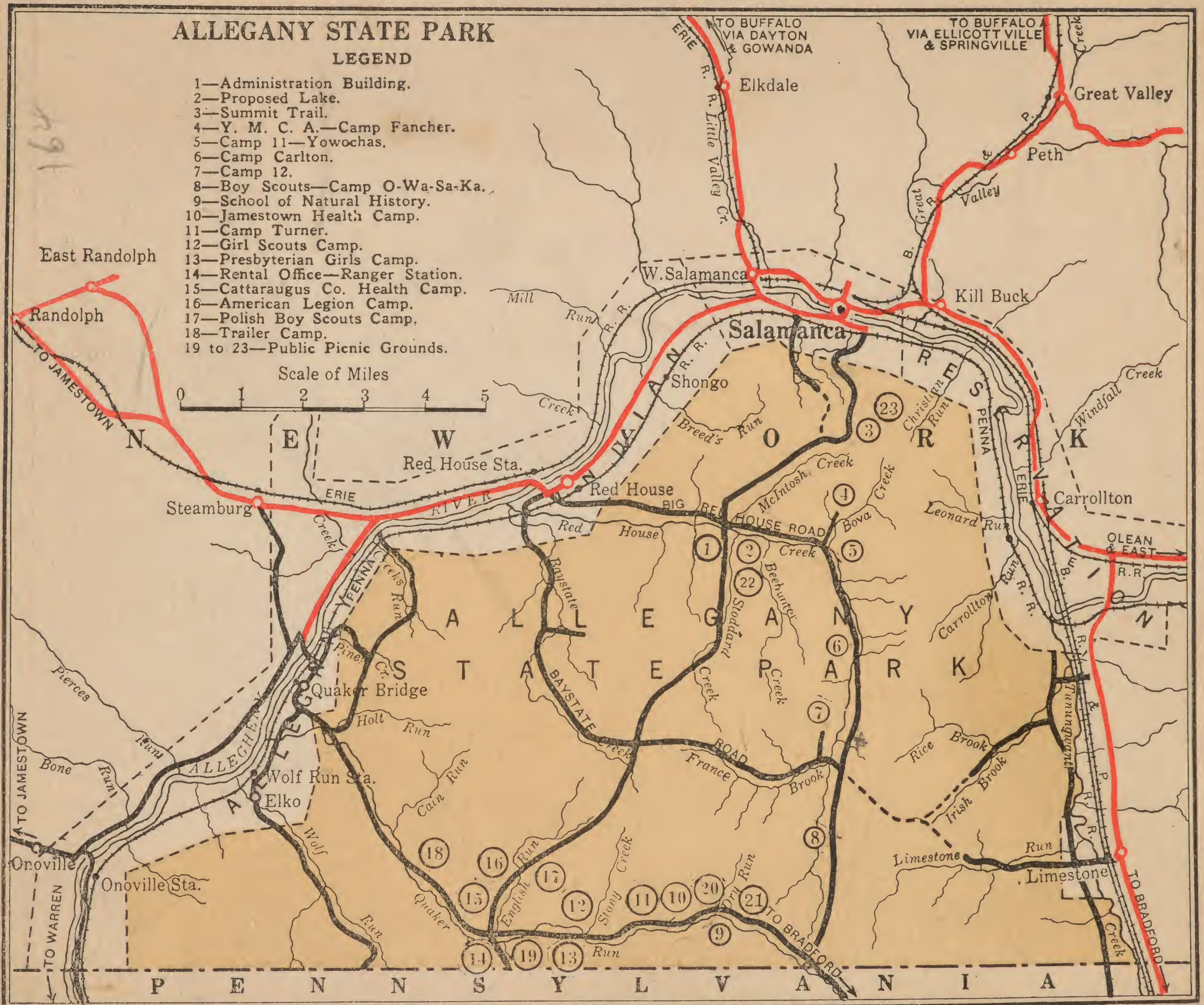
WATER
(continued on p. 10)

WOODS

(when shown, printed in order)

A FEW FIGURES REGARDING THE PARK

Area 65,000 acres; distance around boundary 45½ miles; highest elevation 2475 feet above sea level; distances from Administration Building to, Quaker Run Camping area 9 miles, Salamanca 7 miles, Olean 25 miles, Jamestown 29 miles, Bradford 13 miles.



THE ALLEGANY STATE PARK

Is for your enjoyment

We are pleased to have you with us and hope you will visit the Park many times in the future.

MAKE IT YOUR SUMMER HOME

Comfortable, well equipped cabins and tents rented at reasonable rates.

Fully equipped picnic grounds.

A well stocked general store, in the Quaker Run camping Area, open from June 15th to Sept. 15th.

Swimming, tennis, baseball, quoits, horseback riding.

Restaurants and refreshment stands for meals, lunches and soft drinks.

Miles of hiking and bridle trails.

Museum and Restaurant in the Administration building.

ALLEGANY STATE PARK COMMISSION

HEADQUARTERS ADDRESS:

Administration Building,
Red, House N. Y.
Phone: Steamburg, 13-A

RENTAL OFFICE ADDRESS:

(June 1st to Sept. 15th)
Quaker Bridge, N. Y.
Phone: Steamburg, 26-C

Knapp 20'
Oswayo 100'
120

Cattaraugus
Sagerstown 100'
Salamanca 30'
Amity 140'
Panama 30'
300

Chadakoin
Ellicott 270'
Dexterille 150'
420'

Road Trip 30 miles

Handlevelling from Creek to road intersection

0' - 43' - Covered.

8-9 43' A lot of soft brownish grey sandy shale splitting into small, thick ^{flat} plates because of the ~~fracture~~ close jointing and fracturing. Fossils are of rare occurrence in the shale. Sandy ~~lumpy~~ ^{in the top} masses with considerable sand, contain fossils. The soft shale is capped by hard sandstone having irregular fracture and abundant fossils, plant remains as well as invertebrates. Pelecypods are fairly common. Spizifer dignatus and a Camartocchia are the most abundant shells.

43' - 49'± hard sandstone, breaking in places into plates, in others into irregular slabs. Sh. calcareous fossils preserved with shell. S. dignatus & Camartocchia abundant but usually localized in bands or lenses.

10-11 Between 10th & 11th steps rock is mostly covered, but a calcareous slab at about 38' contained good specimens of Camartocchia, Mytilus, and S. dignatus? in abundance.



11-12th Steps - mostly covered. At top of 12 and in 15th step is thin-bedded shale, reddish on surface of chips but clayey & brown on surface. July 10, 30 a fracture surface

Date July 10, 30 Author

Camartoechia occurs in the shale rarely.

13^{Step.} At top of 13 is about 10' soft arenaceous shale ^{thin bedded} & bluish ss & in a few places are calcareous arenaceous lenses. *S. disjunctus* & *Camartoechia* are common, also *Leptena* & *Grammysia*. Should be photographed in morning. Exposure is behind last house along roadway on south bank of gully.

400 paces from last exposure is a doubtful outcrop of Chemung calcareous ss & ss abounding in *Productella*. One bed is nearly completely made up of these shells.

460 - Steep bank on N side creek - outcrops of thin-bedded, platy ss with *Productella*. The big slabs in the bank prove Chemung beneath the soil.

750 Spring & broad flat - suggestive of a conglomerate band.

July 11

of Peter Creek School.

Exposure a little west of bend
in Allegany. About 250' along
river and ' high. Exposed
also above R.R. Green & chocolate
~~shales~~ sandy shale and
lenticular cross-bedded, thin &
thick bedded ss. Some of the
layers are rippled. *S. disjunctus*
camerata & *Attheyia* are most
common. Fossiliferous slabs are
abundant along the river's edge.

Mileage 30 miles

July 11, 30

NOTES ON NO. Wolf Run tributary July 16. P.

About 300 yards from highway is outcrop of heavy, coarse sandstone without fossils. Exposed also farther upstream. Both exposures small; the lowest one, spring issues from ss. about 15 or 20' above gully. A small collection was obtained from a loose block.

July 16¹

Ditch on south side road contained small pieces sh., ss + conglomeratic ss. with *Phylloptania*, *S. disjunctus* + a large variety of *Canarotocchia*. It is not possible to know if fragments are in place but they appear to be not far removed from their bed.

July 16²

Small exposure on SW side of road thin-bedded ss + ~~that~~ sandy shaly shale. It contains *Leptæna* in places in great abundance.

Date..... Author.....

July 16³

Bed + E banks of Wolf Run about
1/2 mile S of Jy 12. Small exposures
mostly of thin-bedded, lenticular
sandstones and sandy shale.

"*S. disjunctus*" occurs abundantly & is
common in calcareous bands.
Leiopteria is common. The fauna is
same as July 16² + Jy. 12.

July 17.

Outcrop about 650 paces long
 located 350 paces N of P.O. Similar
 lithological to Elko Mt. exposure
 Fauna also like that of Elko
 Mt. *S. disjunctus*, ^{*Productella*}, *Camerozoechia*
 and *Athyris* abundant. *Edmondia*
 rare. These rocks are also
 exposed on the highway above
 the R.R. cut. Counting these
 exposures the ~~vertical~~ exposed
 thickness is about 50 or 60'.

Photo in the R.R. cut
 Highway exposure, 35 miles
 N of Elko P.O.

NOTES ON NO.

Buffalo Camp.

July 21.

P.

Measuring from Creek level

0' - 5' 5" - 1st. 3' 5" covered by talus. Clear

the remaining two feet are
sandy shale and lenticular
calcareous ss. *S. reginatus?* is
common in thin layers of
thicker lenses. Fossils are not
abundant outside of these beds.
A peccary, a few *Canis* *dentatus*
and rod-like bryozoans were
the only other forms noted.

3' 5" covered

Date

Author

July 23.

Jy 23 - 5' exposure Chemung Pine Creek.
Shaly ss., massive, no fossils.

Jy 23¹ - Railroad cut 2 mi N of
Awaken Bridge. Loose ss and weathered
calcareous ss blocks on steep slope.
Probably weathered out of bed-rock
below. Abundance of similar kinds
of slabs supports this conclusion.
Pecten, Mytilarca, Homiophora, Glass-
sponge, Camerotoechia, S. disjunctus?

Jy 23² - Small exposure heavy bedded
shaly ss. with usual Chemung
assemblage.

Jy 23³ - Small roadside Exp. ss. few
fossils. Large S. dis.

Date.....

Author.....

NOTES ON NO.

July 24 P.

July 24 — Rock covered slopes of having
slabs of ss. Dalmanella cc.

July 24' Camp Carleton

Date Author

NEW YORK STATE MUSEUM, ALBANY, N. Y.

M208-My29-5000(7426)*

NOTES ON NO.

July 25 P.

July 25 - Exposure on hill south of
Salamanca - Lenticular cross-
bedded ss and sandy shale -
S. disjunctus c, Mytilarca ac

80 Date Author

NEW YORK STATE MUSEUM, ALBANY, N. Y.

M208-My29-5000(7426)*

July 27.

Quaker Run. —

Exposures of ss & sh in the bed and banks of the stream — intermittent exposures for about $\frac{1}{4}$ mile — lenticular cross-bedded, sometime rippled sandstones interbedded with irregularly fracturing dark blue grey shale. This shale has a red or purple rust. In the exposures farthest ~~west~~ east there are contorted ss layers forming concretion-like masses in the stream-bed. Ripple marks are common.

Fossils are abundant in calcareous ss. *S. distinctus* a.
Atthis n.
Camarotoechia cc
Leptodesma n.

Photos to be taken

Date

Author

Exposures seen first going S down Penn.
 RR tracks ^{1085 paces} $\frac{1}{2}$ mile S of stream flowing
 between ATN of Allegany in WC
 subquad. The exposures are exactly
 opposite milepost 100-16 on the R.R.
 10-20' of rock is exposed mostly
 crumbly fissile shale and ss.
 The shale is olive green in color
 crumbles easily to small thin
 chips which form a rather steep
 talus. From R.R. level at MP 100-16
 are about 11' of shale followed
 5-10' or more feet of heavy beds
 of calcareous ss and ss. alternating
 with shale of the same kind. The
 ss. in this exposure are fairly
 persistent. The beds just above
 the shale contain *Therapsylla* and
Schellwienella in some abundance.
 These fossils were formerly seen
 only in loose pieces in the
 glacial river gravels or in shale
 material along RR cut see Jy 24.

Date.....

Author.....

Spinerdium is abundant
and also a shell that may be
a *Synsphyris*. These beds
represent probably the lowest
Channing in the whole Park area.

4 pictures taken

Total distance of exposure 721 paces.
1534 paces south of M.P.

From pace 534 the road is covered for
600 paces. then exposed for 500 more

M.P. 103-13 is about 50 yds south of end of
road

West valley road ends exactly
1 mile from S-turn at 1396' in C
subquad.

Exposure 600 paces N of M.P. 102-14 and
another in a small gully 254 paces
N of Mile Post - M.P. 102-14 is opposite switch.

M.P. 100 from Oil City, Pa - 18 from Olean

the teeth. The ss are shaly. At
the top about 125-30' from the
base are cross-bedded ss.

Fossils are abundant but
not well preserved. The fauna
resembles that seen at Jy 31 or Aug 1.

Genera seen are

Aviculopecten n.

Orbipecten n.

Camarotoechia not abundant

Spirifer dis c

Schellwienella n.

Dalmanella n.

The exposure is 500 paces in length
from permanent gully.

Aug 7

Exposure of hard cross-bedded ss and sh. exposed for about 20'. At top of exposure is a thick layer about 2' of calcareous ss. abounding in *Spinifers*. Other fossils seen were *Camerofoecia*, *Ambocoelia*, *Dalmanella*, sponges, *Leptodermis*, *Productella*. Collecting is not good.

Aug 7¹ - small exposure of sh. + ss about 1' vertical. *Camerofoecia contracta* ~~and~~ common

Aug 7² - Outcrop of 20' of dark brownish green sh + ss. the bottom of which is exactly 50' below the top of the hill. The shale is blocky, fragmenting into small chips. The ss are rather fine-grained weathering to light green. The sh. contain much fine sand. Fossils except for ~~poorly preserved~~ fragments of plants are lacking

Date

Author

The impression of a *Lingula* was also seen. The sandy sh. is characterized by minute wrinkling and development of mica.

Age - There is a bench at the base of the hill which ^{is held up by the} may be the Salomanka or Killbuck. Conglomerate blocks are wholly lacking. Scattered loose fragments of red shale suggest a Catteraugus age. I incline to Ismay for its age.

NOTES ON NO. Aug 73

P.

McIntosh Creek Rd. - Exposures below
Summit Camp and between Salamanca
road: - 400 paces from intersection
new road intersects with old. From
new road + old intersection

S 40° E - 250 paces

S 70 E - 115 " "

S 82 E - 615
359
615

to bridge

100
100
200
615

Aug 73

925 paces from intersection is
exposure of sh. 100 paces long
exposing 1' of shale. Rock is
bright green ~~and red~~ Thin-bedded
ss and soft rather blocky
red shales. No fossils were seen

Aug. 74 - Brown & green coarse
ss and sh. & ss-sh. cong.

Date

Author

Salamanca - Park highway -

Upper Rd - Outcrops occur in the south gutter and bank of the road nearly down to its intersection with the main road. This

S 25 W 169
S 65 W 63
S 90 W 50
N 61 W 167
N 25 W 322
N 36 W 81
N 70 W 60
N 83 W 120

Channing is like that on the lower road. It

is much higher stratigraphically than the exposures along the RR tracks to the east. *S. disjunctus* in large forms is common, *Camarotoechia* also. *Athyris* occurs in the lower beds. *Dalmanella* and *Schulmanella* were not seen. *Orbipecten* occurs in broken specimens.

Main Road.

Branches off old road going up Parker Hill 250 paces N of small bridge.

S 19W 180 -

S 52W 100 - upper Road at 40 paces

S 89W 40

N 63W 156

N 37W 94 - exp. + blocks at beginning

N 28W 200 - actual exp. at end of this step.

N 66W 105

N 85W 90

S 74W 230 At end of this sight is

junction with upper road

Good exposure here on

south side of road, + exposed
for 157 paces west

N 89W 636 - Rock is exposed along
this entire interval either
as actual bed rock or slabs
in the soil. At the end of the

exposure where there is a

sharp curve there is an

excellent exposure on the

inside of the curve. Here were

seen *Chonetes*, *Brachygonia*,

Leptodesma, *Camartoechia*, +

S. dignatus c.

S 18W 90

S 25E 422 - at the beginning of

this interval rock was exposed

for about 200 paces but

above it there are only slabs
in the bank.

S 23 E 137

S 28 W - 140 at the end of this
interval is an exposure about
5' vertical and some 30 paces
horizontal.

S 3 E 85

S 29 E 260

S 57 E 130

S 74 E 200

N 42 E 150 at the end of this interval
is the Sweet Water Spring on
the ~~N~~ E side of which is
a small exposure of greenish
blocky shaly ss. with
considerable mica flakes.
No fossils were noticed

This may be a short examination
of the ~~coarseness~~ shale.

S 4 W 180

S 28 E 90

S 40 E 236 - at 163 paces occurs
a heavy bedded conglomeratic
sandstone undoubtedly the
Salamanca. The pebbles are

Date

Author

mostly small. Clay balls and small limonite masses are not infrequent. Above the conglomerate is rather blocky sandy shale brownish green in color and without fossils. This shale shows the minute wrinkling seen yesterday at Aug 7.³ As a matter of fact this Salamanca outcrop here & the shale are not far below the exposure of yesterday which can be seen across the valley. Rock is exposed for this whole interval

S 45 E 300 At 135 and to the end of the interval fossils are abundant in ss. + sandy shale slabs.

560 E 440 Same sandstone slabs at about 250 and for some distance dark greenish brown shales of the Cattaraugus.

527W 120 - at end of interval
at bend thin-bedded, crossbedded
ss. no fossils

52 E 100 - lower green ss.

541 E 140

556 E 250

512 E 60

518 W 275

535 W - 118

at 77 Comes

thin irregularly bedded ss.
greenish in color

554 W 110 - From 0-70 these
wedges occur they are the
same as in cut by cow-
pass just south over
summit hill

586 W 142

580 W 136 to top of hill in
front of "Pop" stand

541 W 100

558 W 58

573 W 284 For the first 100 paces
of this interval there are
greenish grey fine-grained ss.

Date

Author

rather thinly and irregularly bedded. Fossils are rare but a large *Camerozostrophia* is seen most. Wood is common. At the end of the interval is a cow-pass under the and on the W side just east of the cow-pass (toward Salamanca) is a cut in much fractured, leached sandstone. At the cow-pass and at its N entrance is a few feet of soft, sandy green-grey shale much fractured. Leached calcareous lenses abound in a *Spinifer* similar to *S. disjunctus*. Clay balls & limonite concretions are abundant in all the sandy rock.

585w 650 at 360 occurs the outcrop S of the cow-pass on the S side of the road. It is green sandstone, thin-bedded

and cross-bedded, precisely like that at the 2.4 miles from Salamanca. Above it is green red-weathering shale. At this same exposure were found coarse light brown ss. slabs containing *Modiolas*. The slabs were big and probably not far out of place. Some were collected also on top of the exposure.

N 69 W 100

N 42 W 184 here the rd. contacts with ~~the~~ an old road extending S 85 E up to about the compass. The distance from the summit is .65 miles. Along the road are fossiliferous light ss. slabs.

N 85 W 414 (.25 miles) - At the

intersection of the main rd and State Park Ave there is a field of ss. and cong blocks on the N side of the

Date

Author

Road. The top of this ss is
about opposite the small school
at about 2040 or 2060' forming
a flat. I believe these blocks
belong to the Salamanca or
at least to the ss on the
hill which we called Sal. The
blocks are a coarse ss. with
a few small pebbles. The
Modiola slabs occur above
the Sal. first as they did not
far from Salamanca city.

Exposure on curve - Thin-bedded
Oswayo ss. exposed in road. - The
strata is mostly light green, fine
grained, micaceous ss. On the slopes
there is much shale in small
fragments. The shale is red. Some
of the clippings are red on the outside
but ~~rather~~ ~~to a~~ green inside.
This leads to the supposition that
the shales are naturally green but
oxidized to a red color subsequently
to exposure. This may be true
also of the Cattaraugus.

Aug 14' - 1.3 miles ~~from~~ SW of
junction of State Pk Ave &
McIntosh Hollow rd. is a
new exposure of thin-
bedded ss. with fossils. The
latter appear to be Chemung
in age. *S. disjunctus* is
abundant with *C. contracta*.
Other forms are *Productella*

Date.....

Author.....

Leptodroma etc
Mytilarca

1.4 miles from junction comes
fork over to Ad. Building

$$\begin{array}{r} 240 \\ 195 \\ \hline 45 \end{array}$$

To upper rd intersection - .5

To exposure above junction (Chonetes) - .4

To Sweet Water Spring - .8

To Salamanca - .25

To thin bedded shales at curve - .45

To summit - .7

Summit to old rd - .65

To Park Ave Rd — .25 miles

English Creek Road - Going NE from
Fuchs - exactly 2 miles from Fuchs
no more Solomania blocks could
be observed on the roadside. About
1 mile N of this point is the sign
pointing to Bear Spring. Proves
relationships of Spring to Solomania.

Aug 15. - Exposure in Osuways -
exactly 3 miles from Fuchs at its
south end and about 1 mile exposure.
The rock is chiefly ss, rather rotten
from leaching and brown from
the great amount of iron therein.
When fresh it is greenish +
calcareous. Clay balls, limonite
concretions + incrustations are
common. Red shale occurs in
the lower part. Fossils are poorly
preserved and few in number.
A large *canawfuchina* is the
most abundant. In places the
rock is a shell breccia. Wood
is abundant.

Date..... Author.....

From here to 3.5 miles there are exposures & slabs of the same kind of rock but no fossils were seen. After 3.5 there are no more exposures till the intersection with the Bay State Road.

Aug 15' - Oswayo ss at contact of Bay State Rd. - Micaceous brownish porous ss. with ^{very} fragmentary fossils, fragments of *Spinifer* & *Camerozoechian*. The same rock is exposed for .1 mile along the main road to the point where the Bay State road forks east to go to Red House Road. At the east road intersection the rock is sandy shale & shale, thin-bedded rather friable. This I believe represents the base of the Oswayo. Along the roadside for .55 miles there are undoubted Oswayo fragments.

. 8.5 miles at bend is exposure of more heavy bedded ss. The exposure here extends about 100 yds south west along the road. It appears still to be Oswayo. For the whole distance (.85 miles) fragments were abundant on the roadside.

350 paces west of (1.1) there are rather heavy-bedded ss that may represent the contact with the Oswayo and Cattaraugus certainly the rock at 1.1 and for 350 paces back is a soft sandy sh with sandstone & claystone lentils. The shale is closely cleaved and breaks into irregular small blocks. The color is green chiefly but in places is weathered to red. Fossils are not abundant but in concretions *Ptychopteria* and *Spirifer* were found.

Date..... Author.....

The surface of much of this shale is rippled like that seen Aug 7th

at 11.4 outcrop of broken grey ss and below it the Salamanca cong. The Sal. is exposed in big blocks just on the N side of the road. Fossils from this locality were all loose. The Salamanca is exposed for fully 2 miles.

At 2.1 miles from Bay State Rd intersection is an outcrop of Chemung exposed for about 200 yds.

Beginning at curve N of Frink
School -

N 86 E 150

N 70 E 188

N 86 E 110

S 76 E 231

S 87 E 106

N 88 E 382

S 76 E 54

S 62 E 185

Total distance 7

miles

Circle over to Ad. Build
Starting from McCutcheon Rd.

S 73 W 120

S 23 W 265

S 53 W 135

S 42 W 76 - just over old Red Horse Rd

S 22 W 82

S 6 W 425 At 200 is old bridge
over R. H. Creek

S 12 W 480 - Ad Building at 140

S 27 E 91

S 61 E 112 - Here is contact with

Stoddard Hollow Road

Date

Author

where there is an exposure of
Channing. The Stt. road is on the
east side of the creek & extends
S 21 W.

N 36 E 239

N 63 E 86 - Outcrop about 100 yds

S 69 E 700 (91) In the gutter at

this exposure are sandy
greenish brown shales with
few fossils. These are wrinkled
like the Catheraugus.

At 373 is Bee Hunter Creek

Road. 592 Bridge or R H Cr.

N 76 E 56

N 51 E 137

at 75 is bridge over
R. H. Creek

N 15 E 40 - This crosses old R. H. road

N 10 W 85

N 47 W 363

N 58 W 163

N 52 W 100

N 32 W 70

N 9 W 60

N 10 E 191

N 15 W 100

N 51 W 86

N 32 W 95

N 18 E 110

N 20 W 85

Total circle 2,45⁵
miles

Aug 15⁺ — Exposure 6 mi. from
 McCluskey road — just below ^{E of} the
 Ad Building — coarse heavy-
 irregularly bedded ss. with
Schizodus, *Mytilarca*, *Dalmanella*

Aug 16-

Coon Hollow - 600 paces
south of Quaker Run Junction
ss. & shale, similar to Buffalo
Camp.

Aug 16¹ - 300' N of Pa-M Line
small exposure, heavy & thin bedded
ss & cong. Probably Wolf Creek. The
ss & cong (2 or 3') thick is succeeded
by non-fossiliferous bluish
irregularly bedded ss.

Aug 16² - 1060 paces up Coon Hollow
tributary, small exposure Chemung
ss & sh.

Date

Author

Aug 18.

Road between Red House &
Bay State ^{Valley} 150 paces east
of junction with main road
is a small exposure in north
gutter. About 5' of red & green
shale is capped by a $1\frac{1}{2}$ " bed
of ss. having *Ptychopteria*.
This appears to be Cataraugus
and only 155 paces west
on the main road the
Onway is exposed.

Date

Author

Aug 8'

Red House Rd - Opposite
Scout Camp (James Town)
1/2 mile N of junction with
France Brook Rd. Arenaceous
crumpled sh & ss. Contorted
beds & concretions. Fossils
common Chemung - Chonetes
predom. These rocks are exposed
5 along the road for 1/2 mile
to Spring. It is my opinion
Spring reaches top of Chemung
On way to France Brook
Road coarse heavy-bedded
ss blocks & sparsely congl.
boulders occur for about
1/2 mile up the road suggesting
Wolf Creek horizon

Date

Author

Red House Rd - going S. from intersection with France Brook Rd. $\frac{1}{2}$ mile W on France Brook Rd. blocks assigned to Wolf Creek occur and Spring .2 mile W of road intersection is about in Wolf Creek. The top of the Chemung is at about 1720'.

125 paces South of intersection main (new) road branches off - following old road to top of hill.

Along ls rd. hill collected slabs weathered out of Catharagus. Oswayo-Catharagus contact occurs about 800 paces below summit and Salamanca occurs probably at Spring 1500 paces from Red House Rd.

Date..... Author.....

p 27

16

$$\begin{array}{r}
 1454 \\
 1087 \\
 \hline
 5621 \\
 5182 \\
 \hline
 10803
 \end{array}$$

$$\begin{array}{r}
 92 \\
 160 \\
 600 \\
 \hline
 852 \\
 213 \\
 \hline
 1065
 \end{array}$$

NOTES ON NO. Friend Indian School Exposure P.
Mileage Roundtrip - 15 miles

59W 125

530W 273

539W 220

543W 250

522W 300

533W 218 - Solomanca blocks abundant

511W 76

58E 240 - " " - out walks
on E side Rd.

52W 282 - At the end of this step is
the creek (opposite old shed are
Solomanca blocks in great
abundance showing
exposure to be not far
off. Road is right next to
stream and about 10' above
it.

523W 92 Solomanca blocks on road-
side

58W 160 Conglomerate blocks after
after the 523W 92 interval
are very rare. I believe
the Solomanca outcrop
is at the shed in the
stream at about 1800'

Date..... Author.....

North-south shot - 715

600

Conglomerate blocks appear all along the roadside in this elevation but they are probably Olean. at 550 paces comes end of old road which is at 1940' elevation. About 20' above this road occurs an outcrop of greenish ss - called by Locke Oswayo but it must be Cattaraugus. It may be the same horizon as that ~~just~~ about $\frac{1}{2}$ way below Summit Camp + Salamanca in field. Distance to this exposure + Camp Salamanca is 1.4 miles.

57 E 280 Along here is exposed thin-bedded, green + cross-bedded ss, with clay balls and a few *Ptychopetras*

55W 244 at the bend here is an exposure of shale rock - red shale - heavy bedded ss and brown ss.

with limonite layers. It has
all the characteristics of the
Oswayo but seems to be not
high up enough. These are also coarse
of blocks, heavy & irregular in bedding.

515 E 110

545 E 579 - All along this interval
Oswayo is shown - C. alleganica
is common.

519 E 500 - Oswayo all along way
(may be 400)

520 W 54

541 W 92

573 W 175

556 W 58

533 W 225

547 W 300

531 W 49

520 W 75

517 W 250

at 200 on top of a
small rise is a bank of
greenish grey thin bedded
arenaceous shale. In the
woods along the roadside

Date

Author

one conglomerate masses, either
Knapp or Ocean

529W 384

545W 221

541W 500' (197 paces)

500 feet N of the intersection
is a mass of pinkish ^{or yellow} clay
and coarse is probably the
Knapp Creek.

Total distance 3.4 miles

197) 500
394
106
11985
185

500
200

Aug 21

.45 Mi E of Bradford junction
slabs + masses of Knapp in
soil.

1.75 miles E on Quaker Run Rd
from Bradford junction is an
exposure of Onwayo. C. allegania
occurs in isolated pieces

Date.....

Author.....

Aug 21.

Channing - Thin bedded, cross-bedded purple weathering ss. exposed for about .2 mile. Fossils abundant, few kinds -

S. disjunctus
Athyris c
Leptodema

Canarotoechia
Productella c
Edmondia

To Ad. Butchling via E.C.
 Aug 22. Bear Spring is about 50' above sign at road which is exactly 2.1 miles from 7 miles.

Quaker Run -

N 56 E 250 Charming exposed all way

N 32 E 144

N 48 E 180

N 32 E 426

N 26 E 385

N 9 E 106

N 1 W 118

N 1 E 72

N 17 E 142

N 26 E 253

N 20 E 305

N 12 E 232

— 151 old Rd +
Charming exp.

N 21 E 377

Total

Distance 3.4
miles

E Bon Run Road is .1 mile
from English Creek Trail

Date Author

Quaker Run ~~is~~ ^{is} ~~from~~
1475 (now 1400') bench mark
Coon Run Road is 2 miles
from B. M.

NOTES ON NO.

Stoddard Hollow Rd. P.

Survey begun where west branch of Red Horse Rd goes west from main Rd. This is precisely .2 mile from where Bay State Branch joins main Rd. —

S88E120

N67E 84

N35E 71

N4E 75

chips of Oswayo in banks.

N15W120 — Oswayo all along.

N14W 60

N24W225

Oswayo for 40 paces 184

From 114 on Oswayo is exposed

N10W 311

Oswayo all the way

N10E 175

N16E 79

N38E 114

N27E 145

Green ss. Possible Or.

at 100 green sh.

predominant

Date

Author

N 22 E 173 - Green sh all way - some
N 39 E 70 - red sh.
Ptychopora c.

N 77 E 145 71 sh exp ends.

N 43 E 61

N 18 E 136

N 7 W 144

N 16 E 68 - lumpy ss + sh.

N 53 E 200 at 80 Salamanca 1.25 miles

N 88 E 61

S 60 E 63

S 38 E 200

S 55 E 103

S 88 E 142

N 57 E 90

N 28 E 33

N 13 E 153

N 19 E 205

To ⁵⁶ is exactly 1.75
miles at 154 Channing
slabs in bank - big
Chonetes

N 38 E 65 Channing all way